Applicants appreciate the Examiner's thorough examination of the subject application and request reconsideration of the subject application based on the foregoing amendments and the following remarks.

Claims 1-52 are pending in the subject application.

Claims 1-52 stand rejected under 35 U.S.C. §103.

Claim 2-4 were canceled and the limitations thereof were added to claim 1. Claims 6-10 were amended to reflect the change in dependency due to cancellation of claims 2-4 and the incorporation of the limitations of claims 2-4 into claim 1.

Claim 17 was canceled and the limitations thereof and the limitations of claims 3-4 were added to claim 16. Claims 18-20 were amended to reflect the change in dependency due to cancellation of claim 17 and the incorporation of the limitations of claim 17 into claim 16.

Claims 11, 14, 21, and 37 also were amended so as to include the limitations of canceled claims 3-4.

The amendments to the claims are supported by the originally filed disclosure.

35 U.S.C. §103 REJECTIONS

Claims 1-52 stand rejected under 35 U.S.C. §103 as being unpatentable over the cited prior art for the reasons provided on pages 2-9 of the above-referenced Office Action. Because claims were amended in the instant amendment, the following discussion refers to the language of the amended claims, however, only those amended features specifically relied upon to distinguish the claimed invention from the cited prior art shall be considered as being made to

overcome the cited reference. As to claims 2-4 and 17, these claims were canceled in the foregoing amendment and the limitations thereof were added respectively to claims 1 and 16. As such claims 2-4 and 17 are not discussed further herein except as provided in the discussion regarding claims 1 and 16. The following addresses the specific rejections provided in the above-referenced Office Action.

CLAIMS 1-24, 37 & 39-43

Claims 1-24, 37 and 39-43 stand rejected as being unpatentable over Murade [USP 6,531,996] in view of Kimura [USP 6,281,826] for the reasons provided on pages 2-8 of the above referenced Office Action. Applicants respectfully traverse.

As grounds for the rejection, the above-referenced Office Action provides that Murade discloses the invention substantially as claimed by Applicants except that the reference does not specifically teach a pre-charging voltage stabilization section for suppressing fluctuation in the pre-charging voltage that is provided on a preceding stage of the pre-charging circuit. The Office Action further asserts, that Kimura teaches a pre-charge voltage stabilization section as claimed by Applicants.

Applicants claim, claim 1, an image display device including *inter alia*, a pre-charging circuit and a pre-charging voltage stabilizing section. The pre-charging circuit writes a pre-charging voltage inputted in synchronism with a pre-charging control signal into the plurality of data signal lines in a predetermined period of time. The pre-charging voltage stabilizing section stabilizes a pre-charging voltage and supplies the stabilized pre-charging voltage as said pre-

charging voltage to the pre-charging circuit, so as to suppress fluctuation in said pre-charging voltage is provided on a preceding stage of said pre-charging circuit. Further, such a pre-charging voltage stabilizing section is composed of current controlling means and charge holding means, where charge is supplied from the charge holding means when the pre-charging control signal is working and pre-charge voltage supplied from the control signal generating circuit is applied to the charge holding means while the pre-charging control signal is not working, and current control means is used.

Applicants also claim, claim 11, a driving method of an image display device that includes a pre-charging circuit for writing a pre-charging voltage inputted in synchronism with a pre-charging control signal into the plurality of data signal lines in a predetermined period of time. Also, such a precharging circuit stabilizing section is composed of current controlling means and charge holding means that is provided on a preceding stage of said pre-charging circuit, where charge is supplied from the charge holding means when the pre-charging control signal is working and pre-charge voltage supplied from the control signal generating circuit is applied to the charge holding means while the pre-charging control signal is not working, and current control means is used. The driving method includes supplying the pre-charging voltage to the above-described pre-charging voltage stabilizing section, where the pre-charging voltage has an AC voltage in synchronism with one horizontal period of said video signal.

Applicants also claim, claim 14, a driving method of an image display device that includes a pre-charging circuit for writing a pre-charging voltage inputted in synchronism with a pre-charging control signal into the plurality of data signal lines in a predetermined period of

time. Also, such a precharging circuit stabilizing section is composed of current controlling means and charge holding means that is provided on a preceding stage of said pre-charging circuit, where charge is supplied from the charge holding means when the pre-charging control signal is working and pre-charge voltage supplied from the control signal generating circuit is applied to the charge holding means while the pre-charging control signal is not working, and current control means is used. The driving method includes supplying the pre-charging voltage to the above-described pre-charging voltage stabilizing section, where the pre-charging voltage has a DC voltage in synchronism with one horizontal period of said video signal.

Applicants also claim, claim 16, an image display device which displays an image by writing a video signal with respect to a plurality of pixels disposed in a matrix via a plurality of data signal lines. Such an image display device includes a pre-charging circuit and a pre-charging voltage stabilizing section. The pre-charging circuit writes a pre-charging voltage inputted in synchronism with a pre-charging control signal into the plurality of data signal lines in a predetermined period of time before said video signal is written into said data signal lines. The pre-charging voltage stabilizing circuit stabilizes the pre-charging voltage so as to supply charges to the pre-charging circuit by the pre-charging voltage, the charges being not less than an amount of charges which was supplied to said data signal lines by said pre-charging circuit. Also, the pre-charging voltage stabilizing circuit includes includes current controlling means composed of a resistor and charge holding means composed of a capacitance, where charge is supplied from the charge holding means when the pre-charging control signal is working and pre-charge voltage supplied from the control signal generating circuit is applied to the charge holding means while the

pre-charging control signal is not working, and current control means is used.

Applicants also claim, claim 21, a driving method for an display device that includes a plurality of pixels disposed in a matrix, a display section, a data signal line driving section, and a scanning signal line driving section. The display section includes a plurality of data signal lines for respective columns of the plurality of pixels and a plurality of scanning signal lines corresponding to respective rows of the plurality of pixels, for displaying an image by supplying a video signal from each data signal line to each pixel in correspondence with a scanning signal which is supplied from each scanning signal line. The data signal line driving circuit outputs a video signal to the plurality of data signal lines in synchronism with a predetermined timing signal and the scanning signal line driving circuit outputd a scanning signal to the plurality of scanning signal lines by a pulse width control signal which controls an output signal in synchronism with a scanning start signal and a scanning timing signal, and a signal width of the output signal.

The display device also includes a pre-charging circuit for writing a pre-charging voltage inputted in synchronism with a pre-charging control signal into the plurality of data signal lines in a predetermined period of time; a pre-charging voltage stabilizing means for stabilizing a pre-charging voltage from the pre-charging circuit; and a control signal generating circuit for supplying the circuits with a control signal so as to control operations thereof.

Such a driving method also includes suspending a scanning signal for a predetermined period of time when a pre-charging voltage stabilizing circuit having charge holding means and current controlling means as the pre-charging voltage stabilizing means is used to perform

display at fixed brightness in first and second display areas which are respectively provided corresponding to a first portion and/or a second portion on a screen of the display section by a pre-charging voltage inputted from the pre-charging circuit. Further, the charge is supplied from the charge holding means when the pre-charging control signal is working and pre-charge voltage supplied from the control signal generating circuit is applied to the charge holding means while the pre-charging control signal is not working, and current control means is used.

Applicants also claim, claim 37, an image display device including *inter alia*, a plurality of pixels disposed in a matrix, a display section, a data signal line driving circuit, a scanning signal line driving circuit, a pre-charging circuit for writing a pre-charging voltage inputted in synchronism with a pre-charging control signal into the plurality of data signal lines in a predetermined period of time, a pre-charging voltage stabilizing means for stabilizing a pre-charging voltage from the pre-charging circuit, and a control signal generating circuit for supplying the circuits with a control signal so as to control operations thereof. The pre-charging voltage stabilizing means includes a pre-charging voltage stabilizing circuit having charge holding means and current controlling means, where charge is supplied from the charge holding means when the pre-charging control signal is working and pre-charge voltage supplied from the control signal generating circuit is applied to the charge holding means while the pre-charging control signal is not working, and current control means is used.

Also for such an image display device in a non-match image display mode, one portion of the display section is set as a video data non-display area which avoids display of video data and the image display device further includes a control signal generating section for suspending a

scanning signal for a predetermined period of time is provided in the control signal generating circuit, when performing display at fixed brightness in the video data non-display area by a pre-charging voltage inputted from the pre-charging circuit.

The present invention advantageously provides an image display device having a pre-charging function to (i) suppress an increase of power consumption, and to (ii) particularly improve a writing performance of writing a video signal into a data signal line, and a driving method of such an image display device. Specifically, by including a pre-charging voltage stabilizing section, fluctuation in a pre-charging voltage can be suppressed, and thus the data signal lines can be charged to a desired potential, and deterioration of image quality of the image display device can be suppressed. In addition, since the image display device does not require a current amplifying circuit, an increase of power consumption can be suppressed. See also page 13, line 20 through page 14, line 2; and page 15, lines 3 through line 11 of the subject application.

More particularly, the precharge voltage stabilization section is made up of a current control means composed of a resistor and a charge holding means composed of a capacitance. Since the voltage (charge) supplied to the data signal line is held by the charge holding means, charge can be supplied from the charge holding means while the pre-charging control signal is working. Further, the pre-charging voltage supplied from the control signal generating circuit may only be applied to the charge holding means while the pre-charging control signal is not working, and only a necessary amount of current is flown into the charge holding means by using the current controlling means. Thus, power consumption can be reduced (See page 15, lines 12-

24 of subject application).

As indicated previously, Murade relates to an electro-optical apparatus and an electronic apparatus, and an object of Murade is to provide a liquid crystal device capable of displaying a high-quality image including no non-uniformity in contrast or color even when the scanning direction is inverted (see column 2, lines 49-53 of Murade). The TFT array substrate described in Murade includes: a *precharging circuit for supplying a precharging signal having a predetermined voltage level to a plurality of data lines* before an image signal is supplied; a sampling circuit for sampling the image signal and supplying the resultant signal to the plurality of data lines; a data ling driving circuit; and a scanning line driving circuit. The scanning line driving circuit supplies a scanning signal in the form of a pulse to the scanning lines in accordance with a clock signal CLY, an inverted clock signal CLY_{INV}, a start signal DY, and power supply voltages VDDY and VSSY, which are supplied from an external control circuit via external terminals.

As also previously indicated, Murade does not disclose a pre-charging circuit that receives a pre-charging voltage stabilized by a pre-charging voltage stabilizing section in synchronization with a pre-charging control signal, nor disclose that the stabilized pre-charging voltage is written into the data signal lines by the pre-charging circuit. In sum, Murade is completely silent as to the particular form and structure of the mechanism or circuitry that provides or generates the so-called pre-charging signal and which is provided or inputted to the pre-charging circuit. It also necessarily follows that Murade offers no motivation for making the suggested modification or that such a modification would be reasonably successful.

As to Kimura, this references relates to a D/A converter that includes a set of conversion capacitors, a set of coupling capacitors, and a switch which is located between the capacitors so as to control the electric potential of these capacitors. In the D/A converter of Kimura, the j-th capacitor has a capacitor value greater than a combined capacitor value of the 1st to (j-1)th capacitors. Thus, no "reverse change in the output signal" occurs. No additional circuit is necessary. That invention is readily applicable and inexpensive (see col. 4, line 31 to the bottom line of Kimura). Kimura provides that the D/A converter has excellent linearity and hence provides a liquid crystal panel free of reverse changes in image grayscale levels. See col. 12, lines 34-39 of Kimura.

Kimura relates to a signal line pre-charge method which is characterized in that: each signal line has a switch selecting one of different pre-charge DC potentials and selectively connecting the signal line to that pre-charge DC potential; and by operating the switches so that a signal lines connects to a pre-charge DC potential, the signal line is pre-charged in the same polarity as that of an image signal in relation to the center voltage of an amplifier. Liquid crystal degradation is prevented by periodically reversing the polarity of drive signals. See col. 13, lines 6-26 of Kimura. In addition, in Kimura, the signal lines are pre-charged by successively turning on/off the associated switches at a predetermined cycle in a horizontal blanking period and a horizontal selection period.

Further, the charging/discharging related to pre-charging operation in Kimura occurs only on the signal lines. Power consumption increases caused by pre-charge speed increases are

reduced, and precise voltages can be applied to the signal lines. That is, precharging accuracy (stability) is improved. See col. 13, line 62 to col. 14, line 1 of Kimura.

In addition, in the signal line pre-charging method of Kimura, the signal line charging/discharging is adjusted through the control of the cycle for the switches connected to the signal lines. Thus, the signal lines are pre-charged to a predetermined voltage level. The signal lines are pre-charged to a predetermined voltage level by controlling the connection cycle while the signal lines are being connected to a pre-charge voltage. Through this operation is controlled the amount of charges. See col. 15, lines 23-32 of Kimura.

According to Figures 14A and 14B of Kimura, QA = CA (Vo-Vx) and QB = CB (Vc-VCOM). CA is the capacitance of the capacitor 2000 (conversion capacitor), and CB is the capacitance of the capacitor 2100 (coupling capacitor). Also, current IS flows when Vc < Vx, and current IR flows when Vc > Vx. See col. 21, lines 12-26 of Kimura.

In addition, according to Figures 46A and 46B of Kimura, the stray capacitances (equivalent capacitance) C22 and C23 associated with the pre-charge lines L1 and L2 are sufficiently greater than the stray capacitance (equivalent capacitance) C21 associated with the signal line S. The signal lines are pre-charged by the movement of charges between C21 and C22 (or C23). See col. 40, line 65 to col. 41, line 3; and col. 42, lines 9 to 12 of Kimura.

As indicated above, Kimura includes two types of capacitors: conversion capacitor and coupling capacitor. Current IR or IS flows due to a potential difference (VC or VX). In contrast, the pre-charging voltage stabilizing section of the present invention is characterized in that: the section is made up of current control means composed of a resistor and charge holding means

composed of a capacitance: charge is supplied from the charge holding means when the pre-charging control signal is working; pre-charge voltage supplied from the control signal generating circuit is applied to the charge holding means while the pre-charging control signal is not working; and current control means is used.

As such, although Kimura may share some common points with the present invention, including functions of capacitors, current flow, and reduction in power consumption, this in of itself can hardly be said to set forth a disclosure, teaching or suggestion of the pre-charging voltage stabilizing section of the present invention. Further, it cannot be said that this provides any teaching, suggestion or offer any motivation for modifying the image display device of Murade so as to yield the invention as set forth in any of independent claims 1, 11, 14, 16, 21 or 37.

Applicants would respectfully submit that at least for the foregoing reasons each of dependent claims 5-10, 12-13, 15, 18-20, 22-24, and 39-43 are considered to be distinguishable from that disclosed and taught in the combination of Murade and Kimura.

It is respectfully submitted that claims 1, 5-24, 37 and 39-43 are patentable over the cited reference(s) at least for the foregoing reasons.

CLAIMS 25-36 & 38

Claims 25-26 and 38 stand rejected as being unpatentable over Murade in view of Kimura and further in view of Takeda, et al. [USP 5,223,824; "Takeda"] for the reasons provided on page 8 of the above referenced Office Action. Applicants respectfully traverse.

As indicated above in the remarks regarding the rejection of claims 1-24, 37 and 39-43, the combination of Murade and Kimura does not disclose, teach nor suggest providing a pre-charging voltage stabilizing circuit of the present invention, more particularly the combination does not disclose, teach nor suggest providing a pre-charging voltage stabilizing circuit of the configuration and arrangement as set forth in any of independent claims 1, 11, 14, 16, 21, and 37 of the present invention.

It is respectfully submitted that the foregoing remarks distinguishing claims 1-24, 37 and 39-43 from the combination of Murade and Kimura also apply to distinguish the driving method as set forth in claims 26-36, and the image display device as set forth in claim 38. Therefore for at least this reason, Applicants believe that these claims are allowable over the cited combination of references.

As to the tertiary reference Tekadea, this reference also is being used for a limited purpose and this reference does not overcome the shortcomings noted above regarding Murade and Kimuar.

It is respectfully submitted that claims 25-36 and 38 are patentable over the cited reference(s) at least for the foregoing reasons.

CLAIMS 44-52

Claims 44-52 stand rejected as being unpatentable over Murade in view of Kimura and further in view of Mori, et al. [USP 5,243,202; "Mori"] for the reasons provided on pages 8-9 of the above referenced Office Action. Applicants respectfully traverse.

As indicated above in the remarks regarding the rejection of claims 1-24, 37 and 39-43, the combination of Murade and Kimura does not disclose, teach nor suggest providing a pre-charging voltage stabilizing circuit of the present invention, more particularly the combination does not disclose, teach nor suggest providing a pre-charging voltage stabilizing circuit of the configuration and arrangement as set forth in any of independent claims 1, 11, 14, 16, 21, and 37 of the present invention.

It is respectfully submitted that the foregoing remarks distinguishing claims 1-24, 37 and 39-43 from Murade and Kimura also apply to distinguish the image display device as set forth in claims 44-52. Therefore for at least this reason, Applicants believe that these claims are allowable over the cited combination of references.

As to the tertiary reference Mori, this reference also is being used for a limited purpose and this reference does not overcome the shortcomings noted above regarding the combination of Murade and Kimura.

It is respectfully submitted that claims 44-52 are patentable over the cited reference(s) at least for the foregoing reasons.

The following additional remarks shall apply to each of the above.

As provided in MPEP 2143.01, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F. 2d 1071, 5

USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F. 2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). As provided above, the references cited, alone or in combination, include no such teaching, suggestion or motivation.

Furthermore, and as provided in MPEP 2143.02, a prior art reference can be combined or modified to reject claims as obvious as long as there is a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 19866). Additionally, it also has been held that if the proposed modification or combination would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. Further, and as provided in MPEP-2143, the teaching or suggestion to make the claimed combination and the reasonable suggestion of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). As can be seen from the forgoing discussion regarding the disclosures of the cited references and the admitted prior art, there is no reasonable expectation of success provided in the reference or the admitted prior art. Also, it is clear from the foregoing discussion that the modification suggested by the Examiner would change the principle of operation of the device disclosed in the principal reference.

The Federal Circuit has indicated in connection with 35 U.S.C. §102 that in deciding the issue of anticipation, the trier of fact must identify the elements of the claims, determine their meaning in light of the specification and prosecution history, and identify *corresponding elements* disclosed in the allegedly anticipating reference (emphasis added, citations in support omitted). *Lindemann Maschinenfabrik GMBM v. American Hoist and Derrick Company et al.*,

730 F. 2d 1452, 221 USPQ 481,485 (Fed. Cir. 1984). Notwithstanding that the instant rejection is under 35 U.S.C. §103, in the present case the Examiner has not shown that identified features of Murade corresponds, as that term is used above by the Federal Circuit, in any fashion to the allegedly equivalent feature in its entire claimed form as set forth in any of the independent claims of the present invention.

The Federal Circuit also has indicated that a prior art reference that gives only general guidance and is not all that specific as to particular forms of a claimed invention and how to achieve it, may make a certain approach obvious to try, but does not make the invention obvious. *Ex Parte Obukowicz*, 27 USPQ2d 1063, citing *In re O'Farrell*, 853 F.2d 894, 7 USPQ2d 1673,1681 (Fed. Cir. 1988).

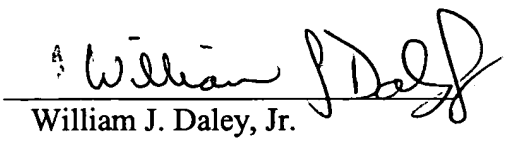
It is respectfully submitted that for the foregoing reasons, claims 1-52 are patentable over the cited reference(s) and satisfy the requirements of 35 U.S.C. §103. As such, these claims are allowable.

It is respectfully submitted that the subject application is in a condition for allowance. Early and favorable action is requested.

Applicants believe that additional fees are not required for consideration of the within Response. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, the Commissioner is hereby authorized and requested to charge Deposit Account No. **04-1105**.

Respectfully submitted,
Edwards & Angell, LLP

Date: August 09, 2004

By: 

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